

OZONE IN ST. LOUIS

It is considered a violation of the one-hour health-based standard for **ozone**, when four or more **exceedances** occur at the same monitor in a three-year period. When a violation occurs, the area is designated to be in **nonattainment**. **Nonattainment areas** are then divided into five classifications based on the severity of the **exceedances** that occurred at the monitor in a three-year period: marginal, moderate, serious, severe and extreme. Under the Clean Air Act, EPA designated many areas in the country as **nonattainment** for **ozone**. In 1999, the St. Louis **ozone nonattainment area** was one of five areas nationwide classified as a “moderate” **ozone nonattainment area**.

The St. Louis **ozone nonattainment area** includes the city of St. Louis, and St. Charles, St. Louis, Jefferson and Franklin counties in Missouri and Madison, Monroe and St. Clair counties in Illinois. The map to the right shows the sites for air monitors in the **ozone nonattainment area**.

Ozone Exceedances

Even though the St. Louis **ozone nonattainment area** reported seven **exceedances** of the one-hour standard during the 2002 **ozone** season (April 1 through October 31), the area as a whole met the one-hour standard for the first time. The manner of calculating the standard allows an average of one **exceedance** per year at each site over a three-year period. As the table on Page 20 shows, even though the total number of **exceedances** in the area increased, the three-year average at every site is below the allowable limit.

The eight-hour standard compares the three-year average of the fourth highest eight-hour **ozone** concentration at each site to the standard, 0.08 ppm. There were 137 **exceedances** of the eight-hour standard. When the designation is made, virtually every site in the St. Louis area will be in violation.

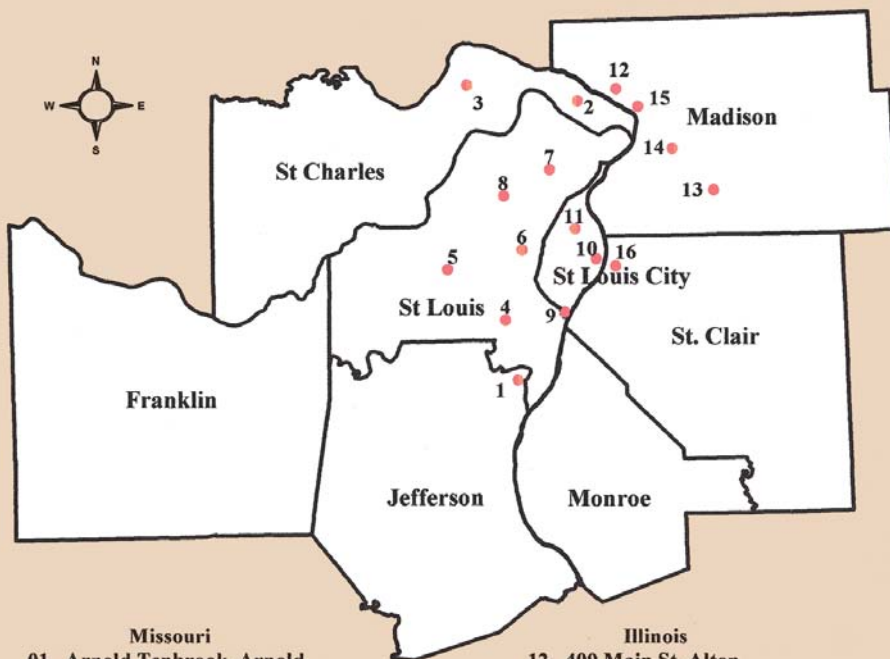
The chart shows the number of days the St. Louis area exceeded the one-hour **ozone** standard in comparison to the number of days weather conditions were favorable for exceeding this standard. This chart reflects the importance of individual

Exceedance: An **exceedance** occurs when levels of a certain pollutant are higher than those deemed safe by the federal government.

Violation: Four or more **exceedances** at the same air quality monitor in a three-year period equal a violation of the one-hour standard.

Nonattainment: An area that has had a violation is classified as “**nonattainment**.” **Nonattainment areas** are then divided into five categories: marginal, moderate, serious, severe and extreme.

St. Louis Ozone Nonattainment Area Monitoring Sites



- | Missouri | |
|----------|-----------------------------------|
| 01 | Arnold Tenbrook, Arnold |
| 02 | West Alton |
| 03 | Orchard Farm |
| 04 | 4580 S Lindbergh, Affton |
| 05 | 305 Weidman Rd, Queeny Park |
| 06 | 55 Hunter Ave, Clayton |
| 07 | 3400 Pershall Rd, Ferguson |
| 08 | 10267 St Chas Rock Rd, St Ann |
| 09 | 8227 S Broadway & Hurck, St Louis |
| 10 | 1122 Clark & Tucker, St Louis |
| 11 | Margaretta, St Louis |

- | Illinois | |
|----------|----------------------------|
| 12 | 409 Main St, Alton |
| 13 | 200 W Division, Maryville |
| 14 | Poag Road, Edwardsville |
| 15 | 54 N Walcott, Wood River |
| 16 | 13th and Tudor, E St Louis |



actions in controlling **ozone**. In recent years, weather conditions have been favorable to the formation of high levels of **ozone** in the St. Louis area on several days. However, through carpooling, postponing mowing, avoiding use of charcoal lighter fluid and many other voluntary efforts, St. Louis area residents were able to prevent high **ozone** levels on many of those days.

Number of Days with Excessive Ozone

St. Louis exceeded the **ozone** standard each summer between 1996 and 2002. The table below shows the number of days that sites in Missouri and Illinois reported exceeding the one-hour **ozone** standard. The St. Louis **ozone nonattainment area** reported six **exceedances** of the one-hour standard during the 2002 **ozone**

Number of Days with Excessive Ozone - St. Louis Nonattainment Area

Number of One-Hour Exceedances												
Site	91	92	93	94	95	96	97	98	99	00	01	02
<i>St. Louis Missouri</i>												
Arnold	0	0	0	2	2	1	1	1	1	0	0	0
West Alton	0	0	0	4	4	1	1	2	3	1	1	1
Orchard Farm					2	1	0	1	2	0	0	2
S. Broadway	0	0	0	0	0	1	0	1	0	0	0	0
Clark	0	0	0	0	0	0	0	1	1	0	0	0
Newstead	0	0	0	0	1	0	0	0	0			
Margaretta										0	0	0
Sunset Hills	1	2	2	2	0	1	1	1	0	0	0	2
Queeney Park	0	0	0	5	1	0	0	1	1	0	0	0
Ladue	0	1	0	3	0	0	0	1	1	0	0	0
Ferguson	0	0	0	2	1	0	1	1	1	0	0	0
St. Ann	0	0	0	4	1	0	0	1	1	0		
Breckenridge Hills											0	0
<i>Illinois</i>	91	92	93	94	95	96	97	98	99	00	01	02
Alton	0	0	2	1	1	2	0	0	1	0	0	0
Maryville	0	0	1	1	1	0	0	0	0	0	0	1
Edwardsville	1	0	0	0	3	0	1	0	0	0	0	0
Wood River	0	0	0	1	2	1	1	0	1	0	1	0
East St. Louis	0	0	1	0	1	0	0	1	0	0	0	0
<i>St. Louis Nonattainment Total</i>	2	3	6	25	20	8	6	12	13	1	2	6

* Jerseyville, IL, which is located just outside of the **nonattainment area**, also reported one **exceedance** of the one-hour **ozone** standard.

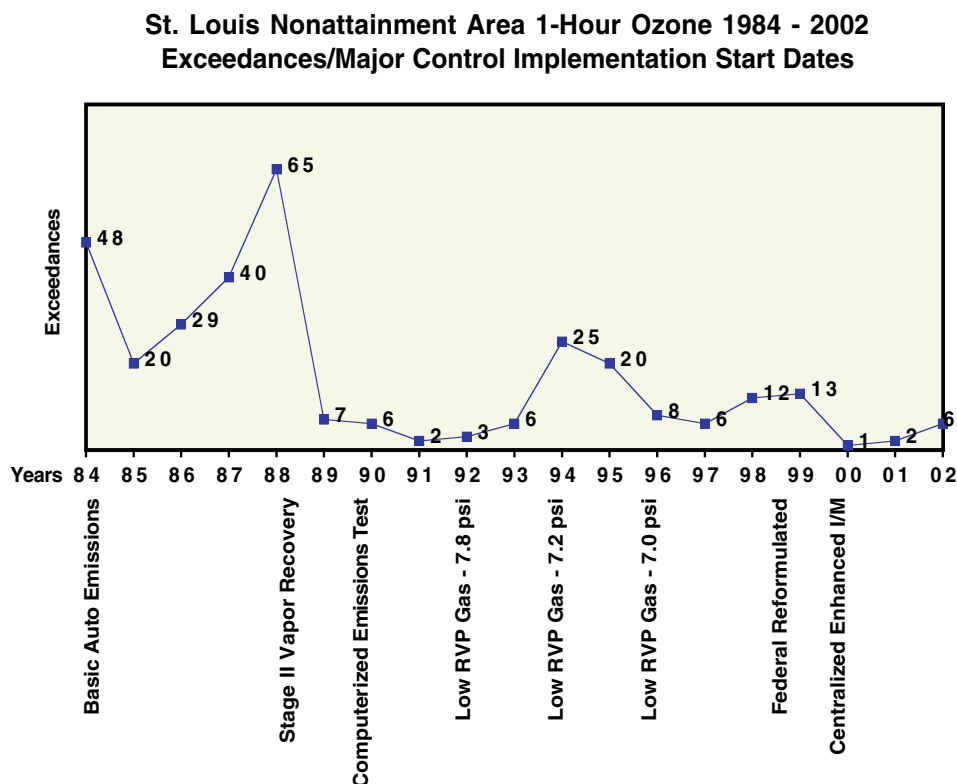
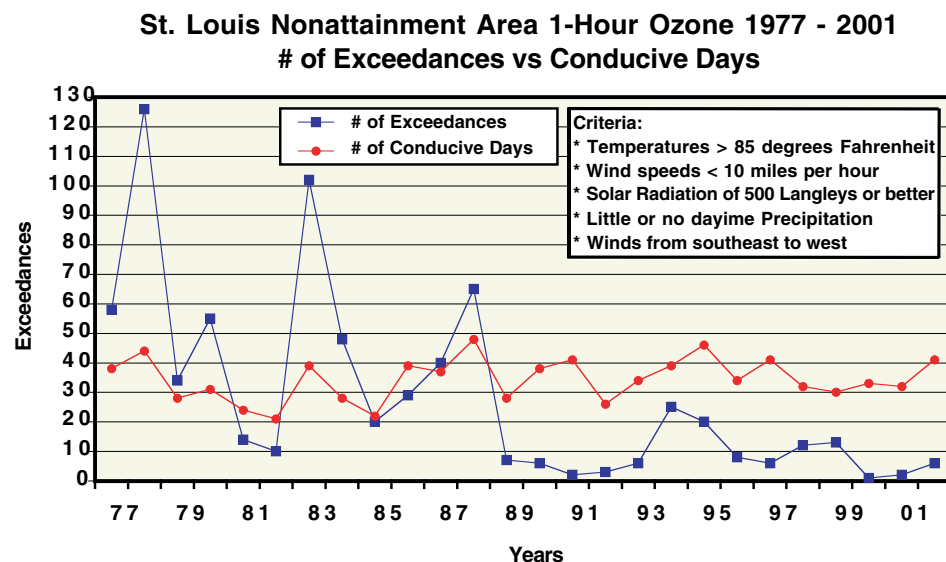
season (April 1 through October 31). Jerseyville, IL, which is located just outside of the **nonattainment area**, also reported one **exceedance** of the one-hour **ozone** standard.

CONTROLLING ST. LOUIS OZONE

Missouri's **State Implementation Plan (SIP)** for the St. Louis one-hour **ozone nonattainment area** includes control measures and schedules for compliance with the Clean Air Act in order to attain the federal health-based standard for ground-level **ozone**. To reduce **ozone** concentrations to safe levels, the state must control both industrial and mobile sources of volatile organic compounds (VOC) and **nitrogen oxides (NO_x)**. Cars, trucks and buses are examples of mobile sources of VOCs. Major control measures benefiting St. Louis recently included a vehicle emissions inspection and maintenance program, Stage II vapor recovery systems for gasoline refueling, advanced emissions control systems for industrial sources and controls on **NO_x** emissions from utility boilers. The two control strategies leading to the greatest reductions in VOC emissions are the enhanced vehicle inspection and maintenance program and the use of **reformulated gasoline**.

Conformity Analysis/Determination


In accordance with the 1990 Clean Air Act - section 176(c), all transportation plans, programs and projects are required to conform to air quality plans for transportation-related pollutants in **nonattainment** and maintenance areas. The air quality



conformity analysis/determination is the Clean Air Act requirement that calls for EPA, the United States Department of Transportation and various Missouri and Illinois State, regional and local government agencies to join together in the air quality and transportation planning development process. Transportation conformity supports the development

of transportation plans, programs and projects that allow areas to meet and maintain **national air quality standards** for **ozone**, particulate matter and **carbon monoxide**, which impact human health and the environment.

The East-West Gateway Coordinating Council conducts and coordinates the



air quality conformity analysis/determination for St. Louis in cooperation with EPA, the United States Department of Transportation and various Missouri and Illinois state, regional and local government agencies. Currently, the air quality conformity analysis/determination is performed on an annual basis.

Vehicle Emissions Inspections

Programs for vehicle emissions testing and repair, or Inspection and Maintenance (I/M) programs, are key mechanisms for controlling mobile source emissions in many urban regions nationwide. The Gateway Clean Air Program is an inspection and maintenance program in the St. Louis **nonattainment** area to control mobile source emissions. The Gateway Clean Air Program represents a large portion of the Department of Natural Resources' **state implementation plan** to bring St. Louis into compliance with the one-hour **ozone** standard.

The Gateway Clean Air Program uses new emissions testing technologies. An enhanced emissions test simulates real driving conditions on a dynamometer (treadmill-like device) during testing. This measures specific pollutants from vehicles much more precisely than the older idle testing system. A second test, called RapidScreen, uses a remote sensing device to monitor exhaust emissions while vehicles are being driven on roads and highways. RapidScreen allows the very cleanest-running vehicles to pass the emissions test without visiting emissions testing stations. An improved version of the idle test is used for vehicles manufactured from 1971 through 1980 and for vehicles tested in Franklin County.

The emission standards of the enhanced emissions testing procedure became more stringent in 2002 according to rule 10 CSR 10-5.380, "Motor Vehicle Emissions Inspection." Due to the more stringent emission standards, the initial failure rate of 1981 and newer model year vehicles increased from an average of 6.7 percent to an average of 10.81 percent. The increase in the number of failed vehicles has led to more vehicles being repaired and more pollution from vehicles being reduced.

On Aug. 29, 2002, the **Missouri Air Conservation Commission** adopted a rule amendment that modified the enhanced emission test requirements for 1996 and newer model year vehicles. Beginning Jan. 1, 2003, vehicles 1996 and newer will have their on-board diagnostics systems tested. If these vehicles pass the on-board diagnostics test, they will not be subject to the new enhanced emissions testing procedure. If these vehicles fail the on-board diagnostics test, they will be subject to the enhanced emissions testing procedure. Vehicles that fail new enhanced emissions testing procedure will have to be repaired and retested. Beginning Jan. 1, 2005, vehicles 1996 and newer will no longer be subject to the enhanced emissions testing procedure and will be required to pass the on-board diagnostics test.

On-board diagnostics is a computerized system that monitors the vehicles' emissions control components. A "check engine" or malfunction indicator light (MIL) turns on if the vehicle develops a problem. To check a vehicle's on-board diagnostics, an inspector plugs a computer into the vehicle and



generates a report on the status of the vehicle's emission control system and whether the vehicle has experienced any emission-related problems that are still present. From 2000 to 2002, the Gateway Clean Air Program checked 1996 and newer vehicles using on-board diagnostics and provided the report to motorists as an advisory only.

This rule amendment adopted by the **Missouri Air Conservation Commission** also modified the enhanced I/M area waiver requirements. Beginning Jan. 1, 2003, before their failing vehicles are eligible to receive a waiver, owners with 1971 to 1980 vehicles will have to spend a minimum of \$200, and 1981-1996 model year vehicle owners will have to spend a minimum of \$450. 1997 and newer model year vehicle owners are already required to spend a minimum of \$450. In addition, all vehicles will have to show a reduction in the pollution for which the vehicle failed its initial test before becoming eligible for a waiver. Beginning Jan. 1, 2005, vehicles 1996

and newer will not be eligible to receive a waiver. A copy of the rule amendment to rule 10 CSR 10-5.380 "Motor Vehicle Emissions Inspection" is available at this Web address: www.sos.state.mo.us/adrules/csr/current/10csr/10c10-5.pdf

Additional information about the Gateway Clean Air Program is available by visiting the following Web sites:

www.gatewaycleanair.com,
www.dnr.mo.gov/alpd/apcp/gcap/
 or www.cleanair-stlouis.com/gcap/.

Low Reid Vapor Pressure Gasoline and Reformulated Gasoline

Since volatile organic compounds (VOCs) contribute to the formation of **ozone**, many VOC control measures are used in the effort to reach **attainment** of the one-hour **ozone** standard. In 1994, St. Louis started using low Reid vapor pressure (RVP) gasoline. RVP is a measure of the volatility of gasoline or its tendency to evaporate into the air. Lowering RVP reduces evaporative emissions

of gasoline. Between 1994 and 1998, a state regulation restricted the RVP of gasoline sold in the St. Louis **nonattainment area** during the warmest months of the year, June 1 through Sept. 15.

Since June 1, 1999, federal **reformulated gasoline (RFG)** is a requirement at retail gasoline stations in the St. Louis **ozone nonattainment area**. This is a gasoline formula designed to burn cleaner than conventional gasoline, and to reduce both exhaust and evaporative emissions by adding an oxygenate such as ethanol and adjusting the amounts of various components already found in conventional gasoline. **This fuel program** is administered and enforced by EPA. Phase II of the **RFG** program, that began Jan. 1, 2000, requires additional emission reductions compared to Phase I. Phase II requires a minimum of 25 percent VOC reductions, a 20 percent reduction in air toxics and a five to seven percent reduction in **NO_x** emissions.